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# Implementing a Six Sigma Initiative in Financial Service Companies

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**Abstract** - In a world of intense competition, Six Sigma is considered to be an important management philosophy, supporting organisations in their efforts to obtain satisfied customers. As financial service organisations have been slow to adopt Six Sigma, issues concerning its implementation are of major importance. For its implementation a large number of tools and techniques have been suggested by academics and practitioners. Intriguingly, despite the extensive effort that has been invested and benefits that can be obtained, the systematic implementation of Six Sigma in financial service organisations is limited. This paper presents a conceptual framework derived from literature and empirical results with a focus on financial services. Using this framework a financial service company should be able to cope with the relevant critical success factors. Thus, the framework allows identifying relevant aspects for a sustainable and successful implementation of a Six Sigma initiative.

**Keywords** - Six Sigma, Framework, Financial Services, Critical Success Factors

## I. INTRODUCTION

Six Sigma becomes more and more popular in financial service organisations especially in European countries. Nevertheless, many banks and insurance companies have problems in applying Six Sigma. Beside basic problems in the conduction of projects the implementation on an organisational level is a major challenge [1]. The idea of Six Sigma is not the execution of single projects. It should be used as an initiative to establish a quality philosophy in the whole company. In this paper, an initiative is understood as a continuous, long-term application of Six Sigma [2].

Many companies are not satisfied with the implementation of their Six Sigma program [e.g. 3, 4]. Furthermore, various reports from German banks and insurance companies show that financial service companies struggle with implementing Six Sigma companywide [5]. In most cases the application is restricted to pilot projects and certain areas within banks and insurance companies. A major reason why companies fail to implement a companywide Six Sigma program is seen in the absence of a theoretical approach how to do this effectively [6]. The challenge is to establish Six Sigma in a sustainable way on an organisational level supporting the companies' strategy. Here, empirical evidence from the German financial service sector shows

that Six Sigma needs a huge amount of organisation, i.e., a framework for its application [7].

Thus, the aim of this research is to explore how financial service companies can implement a Six Sigma initiative on a company level. This includes the definition of the major cornerstones which have to be set up, i.e., a framework. [8] argued that a sound implementation plan, should define what an organisation does, what it is trying to do and how it is going to do it, ensuring that each step builds on the previous one. Thus, our goal is to translate Six Sigma theory into practice through some systematic means. The framework will enable organisations to introduce the elements of Six Sigma in a more comprehensive, controlled and timely manner [9].

## II. SIX SIGMA IN MANUFACTURING AND SERVICE ORGANISATIONS

Although different terms may be used, scrap and rework exist in services just as they do in manufacturing. Inconsistent and out-of-specification processes cause expenses due to rework. Such examples in services may include the need to re-contact a customer to verify an order, providing an incorrect service, or even over-servicing or providing more than what is required. Some widely published success stories of implementations in services include GE Medical Systems, Mount Carmel Health System, Virtua Health, GE Capital Corp, Bank of America, and Citibank. Limited application can also be found in call centres, human resources such as [10, 11].

There are similar Critical Success Factors (CSFs) in manufacturing and services but their order of preference differs. This difference can also be observed within the literature involving Six Sigma implementation in services. The paper by [12] shows that linking Six Sigma to business strategy is the most important of success factors whereas some other literature comes to the conclusion that top management commitment is the most important one, followed by education and training [13].

Critical to Quality Aspects (CTQs) show similarities in terms of cycle time and cost. The concentration in manufacturing is more on product specifications/ characteristics, inventory reduction, and reducing variation whereas services focus more on service time, waiting time, responding to customer, etc. A higher degree of customer integration in service processes might be one reason for this difference.

Key Performance Indicators (KPIs) for both manufacturing and services show much similarity and are

hardly discussed in literature. The application of tools and techniques has similarities in usage of flowcharts, process maps, histograms, Pareto analysis, etc. The use of statistical tools and techniques such as Statistical Process Control and regression analysis is more prominent in manufacturing due to an easier data collection and a continuity of the process. Gauge repeatability and reproducibility are commonly used in manufacturing but not so much in services [14].

The success of Six Sigma in services depends on the outcome of processes but there is little theory to explain the difference between successful and unsuccessful processes [15]. It is required to develop a framework which will attempt to build a theory of how and why Six Sigma works in financial services. The major focus of this research is to develop a framework based on the aspects of Six Sigma implementation. This will help to overcome the existing gap in theory development and also facilitate wider applicability of Six Sigma in service organisations. The little theory in this area prompted us to look for frameworks in other approaches to quality management and in Six Sigma implementation in manufacturing.

There are several frameworks available related to TQM, most of them are assessment frameworks such as the one discussed by [16]. Furthermore, there is limited framework development on Six Sigma implementation in manufacturing. The literature search revealed one framework based on business process change theory [17].

The focus of our framework is on the implementation process from organisation level to project level, i.e., CSFs and KPIs along with CTQ characteristics and portfolio management. Given the nascent stage of Six Sigma implementation in service organisations, our framework is more academic-based. Academic-based frameworks are developed by academics and researchers mainly through their own research and experiences in the field [18].

### III. FRAMEWORK FOR SIX SIGMA IN FINANCIAL SERVICE ORGANISATIONS

Figure 1 gives an overview of the proposed framework. Starting point is the so called CSFs. The relevant CSFs have to be identified being essential ingredients required for success of implementing Six Sigma in an organisation [2, 19]. The idea of identifying CSFs as a basis for determining information needs of managers was popularised by [20]. Narrowing the focus to financial service companies there is little empirical evidence. [21] is the only one specific to service organisations whereas [1] are unique in analysing CSFs for financial service companies. The authors conducted a survey that identifies a cluster of five major CSFs beside top management support for the financial service industry:

- Financial service companies should have *sufficient staff* for conducting Six Sigma projects. The number of staff with respective Six Sigma skills must be appropriate to cover the roles within Six Sigma projects.
- The availability of *sufficient data concerning quality and quantity* is a major topic. Six Sigma projects are

relying heavily on gathering data. This gathering is often not easy in financial service companies, as processes are dominated by heterogeneous IT systems.

- The *focus on customer requirements* is decisive as customers are directly integrated in the financial service product delivery [22]. Financial service processes should be customer-oriented and aim at raising customers' satisfaction.
- In accordance with project plans, a *continuous monitoring of goal achievement* is important. Otherwise projects take too much time without anyone noticing.
- *Integration of the Six Sigma initiative within the overall business strategy*. This is important as there has to be an alignment between Six Sigma projects and company objectives. This also ensures top management commitment towards the Six Sigma initiative.

The proposed framework aims at defining the elements which should be considered when implementing Six Sigma in a financial service company (Figure 1).

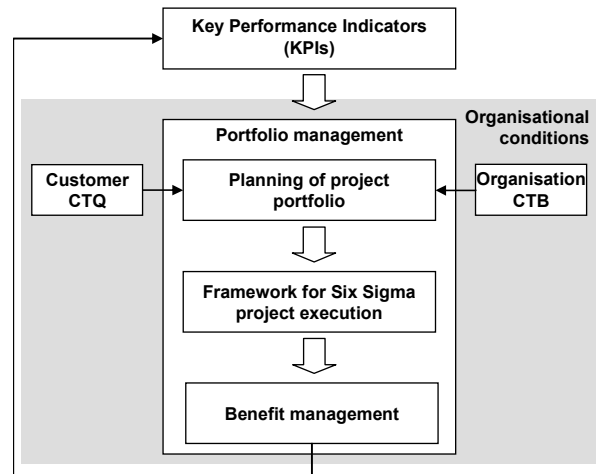


Fig. 1. Conceptual framework for Six Sigma application in service organisations

The CSFs for Six Sigma identified for financial services are reflected in the design of the framework. Core is the portfolio management which is based on KPIs, integrates them in the benefit management and is linked back to the KPIs. The first task of portfolio management, the planning of the project portfolio, is grounded on CTQs as well as CTBs. Organisational conditions are the including supporting tasks such as change management for implementing a sustainable Six Sigma initiative.

#### A. Key Performance Indicators

As argued, the strategic goals of an organisation should be aligned with the Six Sigma initiative. Therefore, the concept of KPIs is best applicable [23]. KPIs are measurements of a performance such as asset utilisation, customer satisfaction, cycle time from order to delivery, inventory turnover, operations costs, productivity, and financial results [24]. Thus, the relevant

KPIs for Six Sigma should be measured and form the basis for the benefit management. The majority of the KPI literature on Six Sigma in services talks about financial benefits [25]. Other KPIs include expressions in terms of customer satisfaction and efficiency. KPIs are used at an organisational level for our framework. In case of Six Sigma, financial benefits or bottom-line results are the most common performance metrics [25]. In our framework, this is reflected by the feedback loop from benefit management to the KPIs.

### B. Portfolio management

The core of the proposed framework is the management of a company's Six Sigma project portfolio. A project portfolio consists of several projects within an organisation. Projects usually compete for resources within a company and should support the companies' strategy [26]. Therefore, projects cannot be managed independently from each other [27, 28]. A company-wide project portfolio management should be established. This project portfolio management aims at coordinating all Six Sigma projects in line with the KPIs. This includes selection, prioritisation, continuous monitoring and allocation of resources [29]. As a result, three major tasks within the portfolio management can be identified:

*Planning the portfolio:* Planning of a Six Sigma portfolio is a major topic for financial service providers. One-third of financial service organisations report problems with choosing the right projects at the start of a Six Sigma initiative [1]. According to [26] the planning of a portfolio (also termed as project portfolio selection) includes strategic considerations, individual project evaluation and portfolio selection. A major focus of research has been on the selection and prioritisation of appropriate projects for a portfolio [29]. These tasks are mainly influenced by the strategic goals and the methodology used for conducting the projects [26]; in this case it is Six Sigma which is applied and the framework is considering the respective KPIs in line with the companies' strategy. Concerning the strategic consideration, [26] highlight that external and internal business factors should be taken into account. In line with the customer focus of Six Sigma this framework proposes the usage of customer (external; CTQs) and organisational (internal; CTBs - Critical to Business aspects) requirements. This should not be limited to strategic considerations but incorporated in the whole task of portfolio planning. Results from previous projects can be used to calculate cost-benefit-estimations more accurately and to select further projects [7].

*Applying the portfolio:* The execution of projects can be seen as the core of Six Sigma activities as these projects actually improve the processes in a company according to the aim of Six Sigma. For the project level of Six Sigma application [30] developed a framework for Six Sigma in service organisations based on surveys and case studies. This framework highlights the same critical issues and thus fits perfectly into the proposed framework

on an organisational level. Core of the framework is the common method DMAIC, including the project phases Define, Measure, Analyse, Improve and Control [12]. The framework identifies three barriers which should be considered while executing projects based on the DMAIC [30]: (1) *Inclusion of CSFs* before executing projects. This issue is addressed by the proposed framework. Problems can occur in terms of missing incentives for successful Six Sigma projects, lack of employees involvement or a resistance to change. (2) *Choice of measurable process parameters*. Results show that service companies often have problems in identifying relevant process parameters and collecting the necessary data with reasonable effort. Empirical evidence shows that this also holds true for the financial service industry [1]. (3) Within the project phases *adequate tools and techniques* have to be identified and used. Some tools and techniques might be too complex to use or not applicable, e.g. service processes are rarely characterised by normal distributions which is a basic assumption for several statistical tools in Six Sigma. Thus, the proper set of tools and techniques has to be identified and used. *Controlling the portfolio:* The application of Six Sigma is extremely data-driven. Not only within the project execution but also on the level of project evaluation the attempt is to measure the effects of changes. On a portfolio level the benefit of the projects conducted should be evaluated. This should be done qualitatively as well as quantitatively. Most important is the comparability of measures for all projects in a portfolio. Otherwise, different projects cannot be compared and ranked according to their impact [26]. Such a benefit management can take place using various methods like Return on Investment (ROI) or Net Present Value (NPV) [31]. But many service companies struggle with this task having different methods for evaluating and comparing Six Sigma projects [32].

### C. CTQ- and CTB-characteristics

CTQ can be defined as product or service process characteristic derived from critical customer requirements. The CTQs or measurable process characteristics which are important from a financial service organisation's perspective are time, cost, and quality. The study of [1] shows that most Six Sigma projects associated with service organisations are concerned with a reduction of cycle time. From the analysis of service strategy context it was found that cycle time is an important CTQ for mass service organisations (e.g. retail banking) whereas waiting time is critical for professional service organisations (e.g. private banking). Reduction in cost is concerned with costs of transaction whereas quality is related to improved accuracy in information provided to customers or improved reliability of service systems, etc. The importance of process parameters varies across service types. To overcome the barrier of identification of process parameters it will be useful to position service organisations as professional service, service shop or mass service [33].

Measures for CTBs are also very important. A high quality improvement to satisfy customers is the aim of Six Sigma, but the cost effectiveness should be considered, too. Here, reducing errors in processes, removing non-value adding processes and minimizing cycle time in critical processes should be considered [21]. The CTBs should be in line with the KPIs defined earlier, i.e., clearly aiming at a positive impact on the KPIs.

#### D. Organisational conditions

The organisational conditions are crucial for the success of a Six Sigma program, because they provide the surrounding in which projects are executed [34]. Major cornerstones of the organisational conditions are the type of general management (Top down or bottom up), the hierarchical coordination (an own Six Sigma hierarchy or integrated in the existing hierarchy) as well as the availability of and incentives for employees [2].

To ensure a successful Six Sigma initiative, employees have to be motivated for an active participation. Therefore, employees have to be educated continuously using incentives [2]. Examples are annual objectives for the employees, defined concepts for careers as well as promotions. Nevertheless, this is not practiced in many companies shown by studies like [35]. The employees questioned mentioned huge deficits in terms of direct incentives for Six Sigma related activities [35].

As Six Sigma is a methodology for improving an organisation this induces changes. These changes have to be taken into account. The implementation of Six Sigma can only be successful, if culture, structure and processes of a company change [34]. Accordingly, a supporting training, management and salary system is necessary [36].

Business process change management is defined as "a strategy-driven organisational initiative to improve and (re)design business processes to achieve competitive advantage in performance (e.g. quality, responsiveness, cost, flexibility, satisfaction, shareholder value, and other critical process measures) through changes in the relationships between management, organisational structure and people" [37], pp 12). In relation to Six Sigma it means the evolution towards a broader, yet more comprehensive process improvement concept.

The majority of companies is still function oriented [38]. This also holds true for financial service companies [1]. Therefore, Six Sigma projects aiming at process improvements usually affect several departments. This complicates the execution of these projects because different managers (e.g. department manager) with differing interests have to be included. A clear assignment of responsible managers for a process (i.e. process owners) and also for a Six Sigma project is an important basis for the success of a project. As suggested by theory, a Six Sigma initiative is lead by a champion or a (master) black belt leading to a parallel-meso structure [39].

A process-oriented view requires different knowledge compared to a function-oriented one [40]. To cope with the challenge of process-oriented thinking and to conduct

a change, involved employees have to be inspired. To enable that, changes have to be communicated and employees trained. Trained employees will thus become internal change agents, who will spread the transformation throughout an organisation [41]. Furthermore, education and training on Six Sigma will be useful to overcome the fear of employees of rigorous statistical and quality tools and techniques [42].

#### IV. CONCLUSION

Six Sigma is a methodology which can be seen as a toolkit to be adapted very flexibly by companies in order to enhance process quality. Within literature a lot effort is put in identifying CSFs to ensure a successful application of Six Sigma. What is missing so far and picked up in this research is the question how to cope with the CSFs identified. The results of this research show that Six Sigma in financial service institutions requires a lot of organisation to be applied successfully. Therefore, a conceptual framework on the organisational level is proposed. Its elements are deduced from relevant CSFs for financial service organisations and based on theoretical as well as empirical results.

Beside the theoretical contribution, the framework can be used by financial service companies to evaluate their Six Sigma activities. The framework will deliver the overall picture helping to identify which relevant aspects have been considered and which are missing. Thus, the Six Sigma initiative can be made more successful.

Next steps of research will focus on the evaluation of the proposed framework. Six Sigma is focussed on a clear denomination of responsibilities and tasks to certain roles in the proposed role model. Therefore it seems to be promising to question different people occupying the leading roles (i.e., Sponsor [Top Management], Champion [Middle Management], (Master) Black Belt and Green Belt). As the framework is very comprehensive, these key persons should be interrogated using a qualitative approach, namely expert interviews.

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